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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,913	07/05/2005	Motoki Numata	2005_0725A	6927
513 7590 05/21/2008 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021				
EXAMINER				
OH, TAYLOR V				
ART UNIT		PAPER NUMBER		
1625				
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05/21/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/534,913

**Applicant(s)**

NUMATA ET AL.

**Examiner**

Taylor Victor Oh

**Art Unit**

1625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **Final Rejection**

### **The Status of Claims**

Claims 1-16 are pending.

Claims 1-16 are rejected.

### **Claim Rejections - 35 USC § 112**

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The rejection of Claims 1-5 and their corresponding dependent claims under 35 U.S.C. 112, first paragraph has been withdrawn due to the modification of claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

### **Claim Rejections - 35 USC § 103**

Applicants' argument filed 2/13/08 have been fully considered but are not persuasive.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**The rejection of Claims 1-16 under 35 U.S.C. 103(a) as being unpatentable over Packer et al (U.S. 4,438,279).**

The rejection of Claims 1-16 under 35 U.S.C. 103(a) as being unpatentable over Packer et al (U.S. 4,438,279) has been maintained with reasons of record filed on 11/13/2007.

Packer et al teaches a process of producing terephthalic acid by oxidation of para xylene and the catalytic hydrogenation of the crude terephthalic acid in the following example (see col. 7 ,lines 1-48) :

### EXAMPLE I

A fluid oxidation effluent produced from the air oxidation of p-xylene in the presence of acetic acid having 5 weight percent water (95 weight percent acetic acid) containing 0.5 milligram atoms of cobalt, 1.5 milligram atoms of manganese and 2.8 milligram atoms of bromine are continuously charged into a stirred-tank type oxidation vessel closed except for inlets for continuous charging of said liquids, continuous charging and return of condensate of exhaust vapors and outlets for the reaction's exhaust (nitrogen, unused oxygen, water vapor, acetic acid vapor and oxides of carbon) containing about 3 volume percent oxygen and the overflow of oxidation effluent. The weight ratio of said acetic acid solution to p-xylene feeds is 3:1. The oxidation reaction is conducted at a gauge pressure of 28 kg/cm<sup>2</sup> and a temperature of 225° C. Such reaction conditions produce an oxidation effluent containing 32.5 weight percent total solids.

A 400-gram sample of said fluid oxidation effluent is taken, cooled to 100° C. and filtered. The resulting filter cake is washed with acetic acid (1:1 weight ratio), dried and analyzed for 4-CBA. The partially purified terephthalic acid, 130 grams, is found to contain 0.26 weight percent 4-CBA.

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A second 400-gram sample of the oxidation effluent is taken and diluted with hot (225° C.) 890 grams of 95 percent acetic acid (5 percent water). The resulting mixture containing 10 weight percent total solids is charged to an autoclave fitted with a stirrer and charged with hydrogen to the gauge pressure of 7 kg/cm<sup>2</sup>. The diluted oxidation effluent is stirred and heated to the temperature of 285° C. and gauge pressure of 50 kg/cm<sup>2</sup>. The autoclave is also fitted with a mesh catalyst basket which can be raised above or lowered into the liquid contents. Before sealing the autoclave there is placed 5.5 grams of particulate catalyst comprising 0.5 weight percent metallic palladium dispersed on high surface per unit weight activated carbon support. The catalyst is lowered into the hot stirred liquid, and left therein for 100 minutes and then raised out of the liquid to separate catalyst therefrom. The contents of the autoclave are cooled to 25° C. The suspension at the temperature of 25° C. is filtered to collect the terephthalic acid precipitate which is then washed with fresh acetic acid (1:1 weight ratio) and dried.

The first vapors flashed while decompressing from the hydrogen free solution to the first crystallization pressure (e.g., from 38 kg/cm<sup>2</sup> to 25 kg/cm<sup>2</sup> gauge pressure) may, in addition to vapors of water and acetic acid, also contain vapors of p-toluic acid stripped from solution by the flashed vapors of water and acetic acid. Such hot pressurized mixture of vapors can better be used to heat either the oxidation effluent or a heat exchange fluid which can be used in a thermodynamic energy conversion (e.g., turbine) to provide mechanical energy for power generation or air compression. Thereafter, the cooled and further decompressed mixture can be used to provide direct heat to concentrate the mother liquor for its recycle to the oxidation as source of catalyst components and so that its oxidizable aromatic content (p-toluic acid and 4-CBA) can be with fresh p-xylene converted to additional terephthalic acid. (see col. 5, lines 17-33).

The instant invention, however, differs from the prior art in that the claimed internal energy possessed by the terephthalic acid cakes or liquid on it does not specify its use for evaporating the liquid in the cake.

Applicants' Argument

Applicants argue the following issues:

- a. The prior art does not teach the solid-liquid separation step and the step of cleaning the crude terephthalic acid which are carried out using a single common device under a pressure not less than the atmospheric pressure;
- b. The liquid remaining on the cakes is evaporated by flash evaporation using internal energy;
- c. The prior art is silent about removing any liquid remaining the cake by flash evaporation after the solid-liquid separation and cleaning steps.

Applicants' arguments have been noted, but the arguments are not persuasive.

First, regarding the first argument, the Examiner has noted applicants' arguments. However, the prior art expressly discloses the followings (see col. 9, lines 2-12):

**The degassed solution separated from the catalyst is then cooled in four steps by flash evaporation of acetic acid at successively lower pressures to a final gauge pressure of 0.7 kg/cm<sup>2</sup>.**

**The resulting suspension of precipitated terephthalic acid is charged to a centrifugal filter, the collected precipitate is washed with fresh 97 percent acetic acid and dried. In the foregoing manner fiber-grade terephthalic acid having less than 0.005 weight percent 4-CBA, less than 0.001 weight percent p-toluic acid and a b-color value below 1.0 can be obtained.**

As shown in the above, there is a teaching about the solid-liquid separation step and the step of cleaning the crude terephthalic acid which are carried out using a

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single common device except for a little pressure difference between the prior art and the claimed invention [ $0.7 \text{ atm (kg/cm}^2 \text{ vs. } 1 \text{ atm)}$ ]; they do not overlap with each other regarding its range. However, they are close enough that one skilled artisan in the art would have expected them to have the similar condition for the process in the absence of an unexpected result. Therefore, applicants' argument is not persuasive.

Second, regarding the second and third arguments, the Examiner has noted applicants' arguments. However, the prior art does disclose the indirect teaching of using internal energy for precipitates (crude terephthalic acid) in the following (see col. 5 ,lines 9-10): **(such) flash evaporation of solvent conveniently permits ready removal of solvent as solute precipitates(crude terephthalic acid).**

Furthermore, "hot pressurized mixture of vapors can be used to heat either the oxidation effluent or a heat exchange fluid that can be used in a thermodynamic energy conversion." (see col. 5 ,lines 23-26). From the above passages, it does imply that it seems reasonable to employ the internal energy for evaporating the liquid in the cake; this is within the purview of the skilled artisan in the art.

Therefore, it would have been obvious to the skilled artisan in the art to be motivated to use the heat from " hot pressurized mixture of vapors" or the flash evaporation step so as to evaporate the liquid in the cake so as to economize the energy consumption during the process. This is because the skilled artisan in the art would expect or predict such a manipulation to be feasible and success as guidance shown in the prior art. Therefore, applicants' argument is not persuasive.



***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Taylor Victor Oh/  
Primary Examiner, Art Unit 1625  
5/19/2008  
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